CLAIMS

1. A medical device for the use in diagnosis and/or treatment of cardiovascular disease in the human body comprising:

a catheter having a proximal catheter end and a distal catheter end and defining a lumen extending from the distal catheter end towards the proximal catheter end, the catheter adapted for use in diagnosis and/or treatment of cardiovascular disease in the human body;

a first expandable and contractible, vessel-occluding element positioned distal of the distal catheter end;

a second expandable and contractible, annular-space-blocking element positioned between the first expandable and contractible element and the proximal catheter end; and

at least one of the first and second expandable and contractible elements comprising spaced apart structural members and a membrane associated therewith.

2. The medical device according to claim 1 wherein the second expandable and contractible element is positioned at and extends from the catheter distal end.

3. The medical device according to claim 1 wherein the second expandable and contractible element comprises a multiple wing, malecot type of expandable and contractible element.

4. The medical device according to claim 1 wherein the second expandable and contractible element comprises a membrane.

5. The medical device according to claim 1 wherein the second expandable and contractible element comprises a multiple wing, malecot type of expandable and contractible element and a membrane associated therewith.

6. The medical device according to claim 5 wherein the membrane covers the multiple wing, malecot type of expandable and contractible element.

7. The medical device according to claim 1 wherein the first expandable and contractible element comprises a braided element.

8. The medical device according to claim 1 wherein the first expandable and contractible element comprises spaced apart structural members.

9. The medical device according to claim 1 wherein the first expandable and contractible element comprises spaced apart structural members and a membrane associated therewith.

10. The medical device according to claim 1 wherein the second expandable and contractible element comprises spaced apart structural members.

11. The medical device according to claim 1 wherein the second expandable and contractible element comprises spaced apart structural members and a membrane associated therewith.

12. The medical device according to claim 1 wherein the first and second expandable and contractible elements comprises spaced apart structural members.

13. The medical device according to claim 1 wherein at least one of the first and second expandable and contractible elements comprises spaced apart structural members and a membrane associated therewith.

14 The medical device according to claim 1 wherein the first and second expandable and contractible elements comprises spaced apart structural members and a membrane associated therewith.

15. The medical device according to claim 1 wherein the first expandable and contractible element comprises a braided element covered with a membrane.

16. The medical device according to claim 1 wherein the first expandable and contractible element comprises a native vessel sealing element.

17. The medical device according to claim 1 wherein a chosen one of the first and second expandable and contractible elements is funnel-shaped when in an expanded state.

18. The medical device according to claim 1 wherein a chosen one of the first and second expandable and contractible elements has a longitudinally-extending opening to permit material to pass therethrough.

19. The medical device according to claim 1 wherein the first expandable and contractible element is movable relative to the second expandable and contractible element.

20. The medical device according to claim 1 wherein the membrane is impermeable.

21. The medical device according to claim 1 wherein the membrane is elastomeric.

22. A medical device for the use in diagnosis and/or treatment of cardiovascular disease in the human body comprising:

a catheter having a proximal catheter end and a distal catheter end and defining a lumen extending from the distal catheter end towards the proximal catheter end, the catheter adapted for use in diagnosis and/or treatment of cardiovascular disease in the human body;

a first expandable and contractible, vessel-occluding element positioned distal of the distal catheter end;

a second expandable and contractible, annular-space-blocking element positioned between the first expandable and contractible element and the proximal catheter end; and

a chosen one of the first and second expandable and contractible elements being having a funnel-shaped surface, when in an expanded state, and having a longitudinally-extending opening to permit material to pass therethrough for receipt of material.

23. The medical device according to claim 22 wherein the second expandable and contractible element is positioned at and extends from the catheter distal end.

24. The medical device according to claim 22 wherein the second expandable and contractible element comprises a multiple wing, malecot type of expandable and contractible element.

25. The medical device according to claim 22 wherein the second expandable and contractible element comprises a membrane.

26. The medical device according to claim 22 wherein the second expandable and contractible element comprises a multiple wing, malecot type of expandable and contractible element and a membrane associated therewith.

27. The medical device according to claim 26 wherein the membrane covers the multiple wing, malecot type of expandable and contractible element.

28. The medical device according to claim 22 wherein the first expandable and contractible element comprises a braided element.

29. The medical device according to claim 22 wherein the first expandable and contractible element comprises spaced apart structural members.

30. The medical device according to claim 22 wherein the first expandable and contractible element comprises spaced apart structural members and a membrane associated therewith.

31. The medical device according to claim 22 wherein the second expandable and contractible element comprises spaced apart structural members.

32. The medical device according to claim 22 wherein the second expandable and contractible element comprises spaced apart structural members and a membrane associated therewith.

33. The medical device according to claim 22 wherein at least one of the first and second expandable and contractible elements comprises spaced apart structural members.

34. The medical device according to claim 22 wherein the first and second expandable and contractible elements comprises spaced apart structural members.

35. The medical device according to claim 22 wherein at least one of the first and second expandable and contractible elements comprises spaced apart structural members and a membrane associated therewith.

36. The medical device according to claim 22 wherein the first and second expandable and contractible elements comprises spaced apart structural members and a membrane associated therewith.

37. The medical device according to claim 22 wherein the first expandable and contractible element comprises a braided element covered with a membrane.

38. The medical device according to claim 22 wherein the first expandable and contractible element comprises a native vessel sealing element.

39. The medical device according to claim 22 wherein the first expandable and contractible element is movable relative to the second expandable and contractible element.

40. The medical device according to claim 22 wherein at least one of the first and second expandable and contractible elements comprises a balloon.

41. A medical device for the use in diagnosis and/or treatment of cardiovascular disease in the human body comprising:

a catheter having a proximal catheter end and a distal catheter end and defining a lumen extending from the distal catheter end towards the proximal catheter end, the catheter adapted for use in diagnosis and/or treatment of cardiovascular disease in the human body;

a support element extending distally of the distal catheter end;

a first expandable and contractible, vessel-occluding element mounted to the support element and positioned distal of the distal catheter end;

a second expandable and contractible, annular-space-blocking element mounted to the catheter and positioned between the first expandable and contractible element and the proximal catheter end;

a chosen one of the first and second expandable and contractible elements being having a funnel-shaped surface, when in an expanded state, and having a longitudinally-extending opening to permit material to pass therethrough for receipt of material; and

at least one of the first and second expandable and contractible elements comprising spaced apart structural members and a membrane associated therewith.

42. The medical device according to claim 41 wherein a portion of the support element is housed within the catheter.

43. The medical device according to claim 41 wherein a portion of the support element is slidably housed within the catheter.

44. The medical device according to claim 41 wherein the first expandable and contractible element comprises a braided element.

45. The medical device according to claim 41 wherein the first expandable and contractible element comprises a braided element covered with a membrane.

46. The medical device according to claim 41 wherein the first expandable and contractible element comprises a native vessel sealing element.

47. A medical device for the use in diagnosis and/or treatment of cardiovascular disease in the human body comprising:

a catheter having a proximal catheter end and a distal catheter end and defining a lumen extending from the distal catheter end towards the proximal catheter end, the catheter adapted for use in diagnosis and/or treatment of cardiovascular disease in the human body;

a first expandable and contractible, vessel-occluding element positioned distal of the distal catheter end; and

a second expandable and contractible, annular-space-blocking device-occluding element positioned between the first expandable and contractible element and the proximal catheter end.

48. The medical device according to claim 47 wherein the second expandable and contractible element is positioned at and extends from the catheter distal end.

49. The medical device according to claim 47 wherein the second expandable and contractible element comprises a multiple wing, malecot type of expandable and contractible element.

50. The medical device according to claim 47 wherein the second expandable and contractible element comprises a membrane.

51. The medical device according to claim 47 wherein the second expandable and contractible element comprises a multiple wing, malecot type of expandable and contractible element and a membrane associated therewith.

52. The medical device according to claim 51 wherein the membrane covers the multiple wing, malecot type of expandable and contractible element.

53. The medical device according to claim 47 wherein the first expandable and contractible element comprises a braided element.

54. The medical device according to claim 47 wherein the first expandable and contractible element comprises spaced apart structural members.

55. The medical device according to claim 47 wherein the first expandable and contractible element comprises spaced apart structural members and a membrane associated therewith.

56. The medical device according to claim 47 wherein the second expandable and contractible element comprises spaced apart structural members.

57. The medical device according to claim 47 wherein the second expandable and contractible element comprises spaced apart structural members and a membrane associated therewith.

58. The medical device according to claim 47 wherein at least one of the first and second expandable and contractible elements comprises spaced apart structural members.

59. The medical device according to claim 47 wherein the first and second expandable and contractible elements comprises spaced apart structural members.

60. The medical device according to claim 47 wherein at least one of the first and second expandable and contractible elements comprises spaced apart structural members and a membrane associated therewith.

61. The medical device according to claim 47 wherein the first and second expandable and contractible elements comprises spaced apart structural members and a membrane associated therewith.

62. The medical device according to claim 47 wherein the first expandable and contractible element comprises a braided element covered with a membrane.

63. The medical device according to claim 47 wherein the first expandable and contractible element comprises a native vessel sealing element.

64. The medical device according to claim 47 wherein a chosen one of the first and second expandable and contractible elements is funnel-shaped when in an expanded state.

65. The medical device according to claim 47 wherein a chosen one of the first and second expandable and contractible elements has a longitudinally-extending opening to permit material to pass therethrough.

66. The medical device according to claim 47 wherein the first expandable and contractible element is movable relative to the second expandable and contractible element.

67. The medical device according to claim 47 wherein the second expandable and contractible, device-occluding element comprises an artificial vessel-occluding element.

68. The medical device according to claim 47 wherein at least one of the first and second expandable and contractible elements comprises a balloon.

69. A medical device for the use in diagnosis and/or treatment of cardiovascular disease in the human body comprising:

a catheter having a proximal catheter end and a distal catheter end and defining a lumen extending from the distal catheter end towards the proximal catheter end, the catheter adapted for use in diagnosis and/or treatment of cardiovascular disease in the human body;

an expandable and contractible, annular-space-blocking element carried by the catheter at or near the distal catheter end;

the expandable and contractible element having a funnel-shaped surface, when in an expanded state, for receipt of material; and

the expandable and contractible element comprising spaced apart structural members and a membrane associated therewith.

70. The medical device according to claim 69 wherein the membrane is an impermeable membrane.

71. The medical device according to claim 69 wherein the membrane is elastomeric.

72. The medical device according to claim 69 wherein the expandable and contractible element comprises a braided element.

73. The medical device according to claim 69 wherein the expandable and contractible element comprises a braided element covered with the membrane.

74. The medical device according to claim 69 wherein the expandable and contractible element comprises a native vessel sealing element.